

UNITED STATES MARINE CORPS
Utilities Instruction Company Marine
Corps Engineer School
PSC Box 20069
Lejeune, North Carolina 28542-0069

U-07C11
U-08D11
MAY 00

STUDENT HANDOUT

TACTICAL QUIET GENERATOR SET OPERATIONS

1. INTRODUCTION:

OVERVIEW: During this period of instruction you will be familiarized with the before operations checks, starting procedures, during operation checks, and the shut down procedures of generator sets that you will encounter as a basic Marine electrician.

2. LEARNING OBJECTIVES:

a. Terminal Learning Objective:

(1) Provided a Tactical Quiet Generator set, a mechanics tool box, and the reference, operate the generator set, so that it will apply voltage to appropriate equipment per the reference. (1141.02.02)

(2) Provided a schematic, a faulty generator set electrical system, and applicable tools and test equipment, with the aid of references, repair the generator set electrical system so that it functions properly in accordance with the appropriate equipment technical manual. (1142.01.03)

b. Enabling Learning Objective:

(1) Provided a Tactical Quiet Generator, without the aid, perform a before operation checks in accordance with the applicable technical manual. (1141.02.02v) (1142.01.03ay)

(2) Provided a Tactical Quiet Generator set and hearing protection, without the aid of references, start the generator, in accordance with the applicable technical manual. (1141.02.02w) (1142.01.03az)

(3) Provided a Tactical Quiet Generator set and hearing protection, without the aid of reference, perform during operation checks in accordance with the applicable technical manual. (1141.02.02x) (1142.01.03ba)

(4) Provided an operating Tactical Quiet Generator, load conditions, frequency requirements and hearing protection, adjust the frequency, in accordance with the applicable technical manual. (1141.02.02y) (1142.01.03bb)

(5) Provided an operating Tactical Quiet Generator, load conditions, frequency requirements, and hearing protection, adjust the voltage, in accordance with the applicable technical manual. (1141.02.02z) (1142.01.03bc)

(6) Provided an operating Tactical Quiet Generator that is connected to a load, and hearing protection, without the aid of reference, energize the load, in accordance with the applicable technical manual. (1141.02.02aa) (1142.01.03bd)

(7) Provided a Tactical Quiet Generator that is energizing a load and hearing protection, without the aid of reference, de-energize load, in accordance with the applicable technical manual. (1141.02.02ab) (1142.01.03be)

(8) Provided an operating Tactical Quiet Generator and hearing protection, without the aid of reference, shut down the generator, in accordance with the applicable technical manual. (1141.02.02ac) (1142.01.03bf)

(9) Provided with a Tactical Quiet Generator, without the aid of reference, perform an after operations check, in accordance with the applicable technical manual. (1141.02.02ad) (1142.01.03bg)

BODY:

1. Before Operations Checks:

A before operations check is exactly what it sounds like certain checks that are performed before we operate a particular item of equipment. This is also known as a 360, (since 360 degrees is a complete circle). As the operator/mechanic you will do a complete tour around the equipment visually inspecting the following:

a. Inspect the grounding rod to ensure all three parts of the assembly are used and that the grounding stud is connected with the proper conductor. Grounding is a very part of safe generator operation for equipment and personnel.

NOTE: FAILURE TO DO SO CAN RESULT IN DEATH, SERIOUS BODLY INJURY, OR DAMAGE TO MISSION ESSENTIAL EQUIPMENT.

b. Inspect the housing, air ducts, exhaust grills, door fasteners and hinges.

NOTE: THE GENERATOR IS DEAD-LINED IF THE DOORS WILL NOT SECURE.

c. Ensure that identification plates are secured and in

place.

d. Check the skid bases to ensure they are not corroded or cracked.

e. Inspect the acoustical materials. Make sure they are not missing or damaged.

f. Look over the engine compartment for damaged, loose or missing components.

g. Check the fuel system for leaks, damage, loose or missing parts.

NOTE: ANY LEAKS OR OTHER DISCREPANCIES DEAD-LINE THE GENERATOR.

h. Inspect fuel-filter/water separator. Drain off any water and contaminants from the container.

i. Check the ether start system for missing or loose hardware.

j. Ensure there are no leaks in the lubrication system. Check the oil level and inspect the oil for contamination.

NOTE: IF ANY CLASS III LEAKS ARE FOUND, THE GENERATOR IS DEAD -LINE.

k. Look for cracks and leaks around the radiator cap and hoses.

NOTE: THE GENERATOR IS DEAD-LINE IF CLASS III LEAKS ARE FOUND.

l. Check the cooling fan for damage or looseness.

NOTE: IF THE FAN IS DAMAGED OR LOOSE, THE GENERATOR IS DEAD-LINE.

m. Check the fan belt for cracks, fraying and looseness.

NOTE: THE GENERATOR IS DEAD-LINE IF THE BELT IS BROKEN OR MISSING.

n. Inspect the radiator coolant bottle for leaks and for the proper level of coolant.

NOTE: GENERATOR IS DEAD-LINE IF A CLASS III LEAK IS PRESENT.

o. Check the muffler for leaks and the exhaust system for corrosion, damaged or missing parts.

NOTE: GENERATOR IS DEAD-LINE IF A DISCREPANCY EXIST AS MENTIONED ABOVE.

p. Inspect the air cleaner element or assembly for damage or restrictions.

NOTE: GENERATOR IS DEAD-LINE IF THE ELEMENT IS CLOGGED OR IF THE PIPING CONNECTIONS ARE LOOSE.

q. Check battery electrolyte level.

r. Check batteries for damaged, loose or corrosion on connections and cables.

NOTE: GENERATOR IS DEAD-LINE IF CABLES ARE DAMAGED OR MISSING. 803/813 GENERATORS HAVE MAINTENANCE FREE BATTERIES.

s. Check Output Box Assembly for loose or damaged wiring and cables.

NOTE: IF CABLES, WIRES OR HARDWARE ARE DAMAGED, THE UNIT IS DEAD-LINE.

t. Check all indicators and controls for damaged or missing parts.

NOTE: MISSING PARTS OR DAMAGE FOR INDICATORS OR CONTROLS CAUSES THE UNIT TO BE DEAD-LINE.

u. Check the control box harnesses for loose or damaged wiring.

NOTE: IF A DISCREPANCY EXISTS, THEN THE UNIT IS DEADLINE.

v. Inspect the parallel cable and connectors for damage if the generator will be used for paralleling operations.

2. STARTING PROCEDURES:

The starting procedures are as follows:

a. Turn the dead-crank switch to the normal position.

b. Ensure the DC Control power Circuit Breaker is pushed in. The DC Control power Circuit Breaker should always be pushed in. If the DC Control power Circuit Breaker is out then you are required to push it in. If this breaker pops back out, a short may have occurred in the Dc control circuits. Stop and notify the maintenance chief.

c. On the 805 and 806 models place the frequency select switch to the proper position (50 or 60 Hz). MEP 815 and 816 model generators do not have a frequency selector switch since they are 400 Hz generators.

- d. On 805/813 ensure AC voltage reconnection switch is positioned to match voltage requirements. On 805/815 and 806/816A generators ensure the reconnection board is positioned to match voltage requirements of the load.
- e. Place AM-VM transfer switch in a position corresponding to output terminal load connections.
- f. On 805/815A and 806/816 models, place Parallel Unit Switch in Unit position. The 803/813 models do not have this switch because they cannot be paralleled.
- g. Place the Master Switch to Prime and Run position.
- h. Push the Press To Test Lamps on both the control panel as well as the malfunction indicator panel.
- i. At temperatures below 40 degrees F place the Master Switch to Preheat for 30 seconds. This applies to the 803/813 models only. On 805/815 and 806/816 models, it may be necessary to use the ether switch. This switch can only be activated while the master switch is in the start position.
- j. Rotate the Master Switch to the Start Position. Caution: Do not allow the starter to crank for more than 15 seconds. Allow at lease 15 seconds in between cranking the starter in order for the starter motor to cool.
- k. Hold the Master Switch in the start position until oil pressure reaches at lease 25 PSI, voltage has increased to its approximate rate value and the engine has reached operating speed. On the 805/815 and 806/816 models, hold the switch in the start position until the engine stops hunting (engine speed stabilizes).
- l. Release Master Switch to Prime and Run position. If operating with an auxiliary fuel source, rotate the Master Switch to Prime and Run Aux Fuel position.
- m. Press Ground Fault Circuit Interrupter Test push-button to test for proper operation. The indicator window should be clear. Pressing the Reset push-button will reset the interrupter. The indicator window will turn red.
- n. Rotate the AM-VM transfer switch to each phase position while observing ammeter (Percent Rated Current meter) .If more than rated load (100%) is indicated in any phase, reduce load.

3. During Operations Checks:

A during operations check will be accomplished DURING the

operation of the particular generator. Inspecting for, but not limited to:

a. Check doors, panels, hinges and latches for damage, loose or corroded items. Inspect the air intake and exhaust grills for debris.

NOTE: IF THE DOORS CANNOT BE SECURED, THE GENERATOR COULD OVERHEAT AND MUST BE REPORTED DEAD LINED

b. Check the engine compartment for loose, damaged or missing hardware.

c. Inspect the fuel system for leaks, damaged, loose or missing parts.

NOTE: IF A CLASS III LEAK EXIST, THEN THE UNIT IS DEAD-LINE.

d. Inspect the lubrication system for leaks, damaged, loose or missing parts. Also inspect the engine oil level and oil consistency for contamination.

NOTE: IF A CLASS III LEAK EXISTS OR ENGINE OIL SHOWS SIGNS OF CONTAMINATION, THEN THE UNIT IS DEADLINE. IF THE OIL LEVEL IS LOW, ADD OIL

NOTE: ON THE MEP 803/813 GENERATORS YOU CANNOT CHECK THE ENGINE OIL LEVEL WHILE THE GENERATOR IS RUNNING

e. Listen for unusual noises from the fan area.

f. Ensure all indicators on the control box assembly are operating properly.

NOTE: IF THE FREQUENCY METER OR THE AC VOLTMETER ARE INOPERATIVE THEN THE GENERATOR IS DEADLINE.

g. Visually inspect the output box assembly connections for arcing.

NOTE: IF ARCING EXIST, THEN THE GENERATOR MUST BE SHUT DOWN IMMEDIATELY!

h. VISUALLY inspect the grounding connections for tightness.

NOTE: THE GENERATOR IS DEADLINE IF THE CONNECTIONS ARE NOT SECURE

i. If too much vibration is noticed, shut down the generator and report it dead-lined to the Maintenance chief.

j. If the engine lacks power, shut down the generator and report it to the Maintenance chief.

k. If excessive smoke comes from the exhaust, first check the air filter indicator, and if the indicator shows no restrictions, then shut down the generator and report it to the Maintenance chief.

l. If the engine fails to respond to the controls shut down the generator. If the generator fails to shut down, press the Emergency Stop Button. Once the generator shuts down report it to the Maintenance chief.

4. **Adjust Frequency:** On 803/813 models using the Frequency Adjust Control, adjust to the proper frequency. On the 805/815 & 806/816 models, adjust the Frequency Adjust Potentiometer to the proper frequency.

5. **Adjust Voltage:** Using the Voltage Adjust Potentiometer, adjust the voltage to 120/208/240/416 for using equipment voltage requirements.

6. **Energizing The Circuit:**

a. Place the AC Circuit Interrupter Switch to Closed position.

b. After the AC Circuit Interrupter has been placed in the closed position, recheck the output voltage, output current and frequency. Adjust as required.

NOTE: LET THE ENGINE RUN FOR AT LEAST 5 MINUTES BEFORE CONTACTING THE AC CIRCUIT INTERRUPTER SWITCH; HOWEVER, THE LOAD CAN BE APPLIED IMMEDIATELY IF NEEDED.

7. **De-Energized The Circuit:** By placing the AC Circuit Interrupter Switch in the Open position this will cut the power that flows to the load studs. The generator must be ran for five minutes to allow for proper cool down.

8. **Shut Down Procedures:**

a. Allow generator set to operate five minutes with no load This allows the engine to cool down.

NOTE: DO NOT TURN THE VOLTAGE ADJUST POTENTIOMETER AND FREQUENCY ADJUST POTENTIOMETER TO ZERO.

b. Place the master switch in the OFF position.

c. Leave the DC circuit power breaker pushed in.

d. Turn the Voltage and Frequency Adjustment Potentiometer down to zero.

e. Place Dead Crank switch to OFF position.

f. Disconnect all cables from load output box, as required.

NOTE: FOR EMERGENCY SHUTDOWN PUSH IN EMERGENCY STOP.

9. After Operations Check:

An After Operations Check will be accomplished AFTER the generator set has been shut down. An After Operations Check consists of all of the before operations checks and services, ensuring all of the major components are functional and serviceable and all fluids are at the appropriate levels.

NOTE: OPERATORS ARE CAUTIONED NOT TO REMOVE THE RADIATOR CAP, AND IF THE GENERATOR REQUIRES COOLANT, ONLY ADD IT TO THE COOLANT OVER-FLOW BOTTLE.)

REFERENCES: TM 09244A/09245A
TM 09247A/09248A
TM 09249A/09246A